simvia GROUPE EDF

Qualiopi-certified provider

Qualiopi processus certifié

INTER-COMPANY TRAINING

Training catalogue

Sessions from January to December 2027

“Build your skills on our open source software with the experts who develop it.”

CODE_ASTER SALOMÉ CODE_SATURNE OPENTELEMAC

12 courses

34 scheduled sessions

4 open-source codes

Version dated 7 October 2026

TRAINING WITH SIMVIA

Master open-source numerical simulation

Simvia, part of the EDF Group, trains engineers, technicians and researchers on the open-source simulation codes developed and used within the group: code_aster, Salomé, code_saturne and openTELEMAC. Our courses are given by the engineers and PhDs who develop and support the software every day, using real industrial cases to make you quickly autonomous on your own studies.

→ Theory revisited, immediate practice

Each theoretical notion is immediately put into practice, with each exercise more demanding than the last.

→ The complete workflow

You learn to operate the whole toolchain together: Salomé, solver, ParaView, QGIS, from geometry to post-processing.

→ Practitioner trainers

Our engineers and PhDs use these codes daily on industrial projects and share best practices and pitfalls to avoid.

→ Close supervision

1 trainer for a maximum of 6 trainees during practical work. When you get stuck, an expert is right beside you.

→ A network of peers

The inter-company format brings together engineers from different sectors around the same technical challenges.

→ On site or remote

At EDF Lab Paris-Saclay in French, or remotely in English over two days one week apart.

A Qualiopi-certified training provider

Qualiopi is the French national quality certification for training providers. It attests to the quality of the process Simvia uses to design, deliver and assess its courses, and allows French companies to request OPCO funding.

The quality certification was issued for the following category of actions: training actions.
Certificate no. CERT_S0626_0919, issued on 19 August 2026, valid until 18 August 2029.

Our courses

COURSE	LEVEL	DURATION	SESSIONS	PAGE
CODE_ASTER				
code_aster and Salomé applied to mechanics	INITIAL	2 days	4 sessions	p. 6
code_aster and Salomé applied to civil engineering	INITIAL	2 days	3 sessions	p. 7
code_aster and Salomé applied to advanced civil engineering	ADVANCED	2 days	3 sessions	p. 8
code_aster: non-linearity, fatigue and multiphysics couplings	ADVANCED	2 days	4 sessions	p. 9
code_aster and MFront: modelling complex mechanical behaviour	ADVANCED	2 days	2 sessions	p. 10
code_aster and HPC computing	ADVANCED	1 day	1 session	p. 11
code_aster from a developer's perspective	ADVANCED	1 day	1 session	p. 12
CODE_SATURNE				
code_saturne and Salomé: CFD simulation	INITIAL	2 days	5 sessions	p. 13
code_saturne: thermo-hydraulics and heat transfer	ADVANCED	2 days	2 sessions	p. 14
code_saturne: CFD atmospheric dispersion	ADVANCED	2 days	2 sessions	p. 15
openTELEMAC				
openTELEMAC: free-surface hydraulic simulation	INITIAL	2 days	4 sessions	p. 16
openTELEMAC: water quality and sediment morphodynamic	ADVANCED	2 days	3 sessions	p. 17

2027 calendar

January – December 2027

Mech Mechanics **GC** Civil engineering **GC+** Advanced civil engineering **NL** Non-linearity, fatigue, couplings **MFront** code_aster and MFront **HPC** code_aster and HPC
Dev code_aster for developers **CFD** CFD simulation **Thermo** Thermo-hydraulics **Atmo** Atmospheric dispersion **Hydro** Free-surface hydraulics **Sedim** Water quality and sediments

AGENDA

All sessions

In chronological order. On site: EDF Lab Paris-Saclay (Palaiseau). Remote: two days one week apart. Click a date to go to the registration page.

DATES	COURSE	FORMAT	LANGUAGE	PAGE
2027				
Jan 12–13	code_aster and Salomé applied to civil engineering	On site	French	p. 7
Jan 28 and Feb 4	code_aster: non-linearity, fatigue and multiphysics couplings	Remote	English	p. 9
Feb 9 and 16	openTELEMAC: free-surface hydraulic simulation	Remote	English	p. 16
Feb 11 and 18	code_saturne and Salomé: CFD simulation	Remote	English	p. 13
Mar 2–3	openTELEMAC: free-surface hydraulic simulation	On site	French	p. 16
Mar 9–10	code_saturne and Salomé: CFD simulation	On site	French	p. 13
Mar 18	code_aster from a developer's perspective	Remote	English	p. 12
Mar 23–24	code_aster and Salomé applied to mechanics	On site	French	p. 6
Apr 1 and 8	code_aster and Salomé applied to civil engineering	Remote	English	p. 7
Apr 15 and 22	code_aster and Salomé applied to mechanics	Remote	English	p. 6
Apr 22 and 29	code_saturne: thermo-hydraulics and heat transfer	Remote	English	p. 14
Apr 27–28	code_aster and Salomé applied to advanced civil engineering	On site	French	p. 8
May 4	code_aster and HPC computing	Remote	English	p. 11
May 11–12	code_aster and MFront: modelling complex mechanical behaviour	On site	French	p. 10
May 13 and 20	openTELEMAC: water quality and sediment morphodynamic	Remote	English	p. 17
May 25–26	code_saturne: CFD atmospheric dispersion	On site	French	p. 15
Jun 3 and 10	code_saturne and Salomé: CFD simulation	Remote	English	p. 13
Jun 15–16	code_aster: non-linearity, fatigue and multiphysics couplings	On site	French	p. 9
Jun 30 and Jul 1	openTELEMAC: water quality and sediment morphodynamic	On site	French	p. 17
Jul 6 and 13	code_aster: non-linearity, fatigue and multiphysics couplings	Remote	English	p. 9
Aug 26 and Sep 2	code_aster and Salomé applied to advanced civil engineering	Remote	English	p. 8
Aug 31 and Sep 7	code_aster and Salomé applied to mechanics	Remote	English	p. 6
Sep 15–16	openTELEMAC: free-surface hydraulic simulation	On site	French	p. 16
Sep 29–30	code_saturne and Salomé: CFD simulation	On site	French	p. 13
Oct 19–20	code_aster and Salomé applied to advanced civil engineering	On site	French	p. 8
Oct 19 and 26	openTELEMAC: free-surface hydraulic simulation	Remote	English	p. 16
Oct 19–20	code_aster and Salomé applied to mechanics	On site	French	p. 6
Oct 26 and Nov 2	code_aster and Salomé applied to civil engineering	Remote	English	p. 7
Oct 28 and Nov 4	code_saturne: CFD atmospheric dispersion	Remote	English	p. 15
Nov 17–18	code_saturne: thermo-hydraulics and heat transfer	On site	French	p. 14
Nov 24–25	code_aster: non-linearity, fatigue and multiphysics couplings	On site	French	p. 9
Dec 2 and 9	code_aster and MFront: modelling complex mechanical behaviour	Remote	English	p. 10
Dec 7–8	openTELEMAC: water quality and sediment morphodynamic	On site	French	p. 17
Dec 7 and 14	code_saturne and Salomé: CFD simulation	Remote	English	p. 13

CODE aster salomé

LEVEL **INITIAL**

code_aster and Salomé applied to mechanics

Discover the fundamentals of mechanical simulation with Salomé and code_aster through a step-by-step training course, illustrated with real-world industrial case studies.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	**On site or remote**	**French / English**	**€1,800 excl. VAT** Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Build the geometry and mesh of a 3D part in Salomé, including mesh groups.

02 Set up, run and check a linear elastic analysis in code_aster.

03 Select structural elements (beams, plates, shells) and connect them to a 3D model.

04 Post-process and compare the results of several modelling options in ParaVis.

Early bird: 10% off the company price
€1,620 instead of €1,800 excl. VAT for any registration by **January 23, 2027**, 2 months before the March 23–24 session.

Upcoming sessions

March 23–24, 2027 **−10%**
EDF Lab Paris-Saclay · French

April 15 and 22, 2027
Remote · English

August 31 and September 7, 2027
Remote · English

October 19–20, 2027
EDF Lab Paris-Saclay · French

Full course page online

Does this sound familiar?

- You want to switch to open-source code for better technological control and a cost advantage, but you don't know how to structure your first simulations.
- Your simulations fail to converge or produce inconsistent results: boundary conditions, material properties, contact, non-linearities.
- You struggle to interpret .mess files and solver messages: has the simulation actually converged, are the results physically consistent?

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic knowledge of continuum mechanics and finite elements.

Detailed programme

DAY 1

MORNING

Overview of code_aster capabilities for mechanics
- The Salomé_Meca ecosystem and code_aster's general capabilities
- How code_aster runs a 3D linear elastic analysis
- Link with AsterStudy

AFTERNOON

The Salomé / code_aster chain on a linear elastic analysis
- CAD and meshing modules (Shaper, Mesh), visualisation with ParaVis
- **Practical:** quasi-static analysis of a 3D pipe elbow, from CAD to results

DAY 2

Structural elements and rigid connections
- Beams, plates and shells: properties of slender elements
- Connections between elements (beam/plate, plate/3D)
- **Practical:** pipe elbow with a shell model, then a hybrid 3D + shell model

Post-processing in code_aster
- Field manipulation and mechanical post-processing
- **Practical:** post-processing the pipe analyses with the different models

CODE aster salomé

LEVEL **INITIAL**

code_aster and Salomé applied to civil engineering

Discover code_aster's civil engineering features, from structural analysis to seismic analysis, through a step-by-step approach combining theory and practical exercises based on real-world case studies.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	**On site or remote**	**French / English**	**€1,800 excl. VAT** Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Run linear and non-linear quasi-static analyses of a structure in code_aster.

02 Select elements and constitutive laws, then compute the reinforcement of a concrete slab.

03 Compute the modal basis of a building and interpret its eigenmodes.

04 Design a building under seismic loading using a structured methodology.

Early bird: 10% off the company price
€1,620 instead of €1,800 excl. VAT for any registration by **November 12, 2026**, 2 months before the January 12–13 session.

Upcoming sessions

January 12–13, 2027 **−10%**
EDF Lab Paris-Saclay · French

April 1 and 8, 2027
Remote · English

October 26 and November 2, 2027
Remote · English

Full course page online

Does this sound familiar?

- You want to adopt open-source code for your structural studies, but don't know where to start.
- You need reliable results: boundary conditions, material properties, non-linearities, reading solver messages.
- You want to go beyond tutorials: automate calculations, chain simulations, run parametric studies.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic knowledge of continuum mechanics and finite elements.

Detailed programme

DAY 1

MORNING

Overview of code_aster capabilities for civil engineering
- The code_aster and Salomé_Meca ecosystem
- Linear and non-linear quasi-static analyses
- **Practical 1:** elastic cantilever plate under gravity

AFTERNOON

Structural analysis
- Element types and constitutive laws for civil engineering
- Connections between elements (beam-plate...), extraction and manipulation of result fields
- **Practical 2:** reinforcement design of a reinforced concrete plate

DAY 2

Modal analysis and dynamic computation
- Features for dynamic and seismic studies
- **Practical 3:** modal basis of a civil engineering building

Design under seismic loading
- Seismic design methodology
- **Practical 4:** seismic design of the same building

CODE aster salomé

LEVEL **ADVANCED**

code_aster and Salomé applied to advanced civil engineering

Go further with code_aster in civil engineering: soil-structure interaction and dynamic impedances, spectral modal analysis, non-linear modelling of reinforced concrete and non-linear pseudo-static analysis, on real building cases.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Compute dynamic soil impedances by coupling MISS3D and code_aster.

02 Perform a response spectrum analysis of a building with soil-structure interaction.

03 Model reinforced concrete with non-linear laws for concrete and steel.

04 Carry out a non-linear pseudo-static analysis including uplift.

Upcoming sessions

April 27–28, 2027
EDF Lab Paris-Saclay · French

August 26 and September 2, 2027
Remote · English

October 19–20, 2027
EDF Lab Paris-Saclay · French

Full course page online

Does this sound familiar?

- You need to account for soil-structure interaction in your dynamic and seismic studies.
- You want to run a complete spectral modal analysis, from set-up to post-processing.
- You need to model reinforced concrete non-linearly and carry out a pseudo-static analysis with uplift.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic command of code_aster, good general knowledge of continuum mechanics and numerical methods, minimal knowledge of non-linear analysis.

Detailed programme

DAY 1

MORNING

Soil-structure interaction and dynamic impedances

- The different soil-structure interaction approaches
- MISS3D – code_aster coupling
- **Practical 1:** computing dynamic impedances with MISS3D and code_aster

AFTERNOON

Spectral modal analysis with soil-structure interaction

- Spectral modal analysis and how soil-structure interaction is included
- Post-processing of spectral modal analysis
- **Practical 2:** spectral modal analysis of a building with soil-structure interaction

DAY 2

Non-linear modelling of reinforced concrete

- Modelling reinforced concrete with code_aster
- Non-linear constitutive laws for concrete and steel
- **Practical 3:** reinforced concrete plate and beam model with material non-linearities

Non-linear pseudo-static analysis

- Non-linear soil-structure interaction (uplift)
- Non-linear pseudo-static analysis methodology
- **Practical 4:** reinforced concrete plate with material non-linearities and uplift

CODE aster

LEVEL **ADVANCED**

code_aster: non-linearity, fatigue and multiphysics couplings

Develop your expertise in code_aster to solve advanced industrial problems, by carrying out non-linear calculations, fatigue analyses and multiphysics couplings.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Control a non-linear quasi-static analysis and diagnose convergence issues.

02 Compute fatigue life using code_aster post-processing tools.

03 Script a staggered thermo-mechanical coupling.

04 Choose solver and parallel options based on runtime and memory use.

Early bird: 10% off the company price
€1,620 instead of €1,800 excl. VAT for any registration by **November 28, 2026**, 2 months before the January 28 and February 4 session.

Upcoming sessions

January 28 and February 4, 2027
Remote · English **−10%**

June 15–16, 2027
EDF Lab Paris-Saclay · French

July 6 and 13, 2027
Remote · English

November 24–25, 2027
EDF Lab Paris-Saclay · French

Full course page online

Does this sound familiar?

- Run robust non-linear analyses and assess the convergence of Newton iterations.
- Estimate the service life of your components with fatigue post-processing.
- Chain thermal and mechanical analyses by scripting, and cut computing time with parallelism.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic command of code_aster, good general knowledge of continuum mechanics and numerical methods, minimal knowledge of non-linear analysis.

Detailed programme

DAY 1

MORNING

Solving non-linear quasi-static problems
- Reminders on non-linear problems and non-linear constitutive laws
- Controlling a non-linear analysis in code_aster (best practices)
- **Practical:** pipe with temperature-dependent elasto-visco-plastic behaviour

AFTERNOON

Advanced post-processing
- Theoretical reminders on fatigue and post-processing in code_aster
- **Practical:** service life calculation

DAY 2

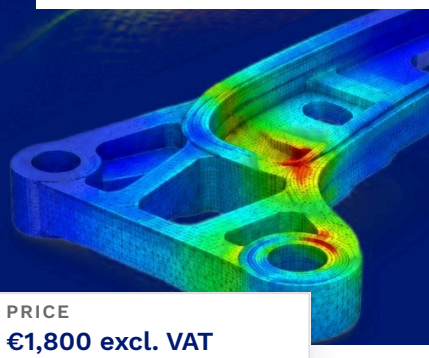
code_aster scripting for coupled analyses
- Staggered formulation of a coupled thermo-mechanical problem
- Managing data exchanges in code_aster
- **Practical:** thermo-mechanical analysis

code_aster and parallel computing
- Parallelism, linear solvers and the options available
- **Practical:** impact of solver options on runtime and memory use

CODE aster

LEVEL **ADVANCED**

code_aster and MFront: modelling complex mechanical behaviour



Master MFront in conjunction with code_aster to develop, validate and integrate your own behaviour models, in order to simulate non-linear materials and behaviour in industrial studies.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	**On site or remote**	**French / English**	**€1,800 excl. VAT** Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Write a non-linear constitutive law in MFront.

02 Validate a law at material point level with MTest, under monotonic and cyclic loading.

03 Compile an MFront law and use it in a code_aster finite element analysis.

04 Account for external state variables (temperature, environment) in the law.

Upcoming sessions

May 11–12, 2027
EDF Lab Paris-Saclay · French

December 2 and 9, 2027
Remote · English

Full course page online

Does this sound familiar?

- Model behaviour beyond the built-in laws: plasticity, viscoplasticity, damage.
- Validate a law at material-point level with MTest before using it in a structural analysis.
- Drive behaviour from the environment: temperature, irradiation, external variables.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic command of code_aster, good general knowledge of continuum mechanics and numerical methods, minimal knowledge of non-linear analysis.

Detailed programme

DAY 1

MORNING

Introduction to MFront and non-linear behaviour
- The MFront / MGIS / code_aster ecosystem
- Plasticity, viscoplasticity, damage, internal variables
- Structure of an MFront file and automatic code generation

AFTERNOON

First implementations and validation with MTest
- The StandardElastoViscoPlasticity brick and material-point tests
- **Practical 1:** cyclic test · **Practical 2:** implementing an elastoplastic law

DAY 2

Integrating an MFront behaviour into code_aster
- MFront ↔ MGIS ↔ code_aster coupling, compilation and loading
- Configuring the non-linear solver
- **Practical 3:** finite element tensile test with elasto-viscoplastic behaviour

Command variables and multiphysics coupling
- Temperature, irradiation, environmental variables
- Passing information between code_aster and MFront
- **Practical 4:** tensile test with environmental dependency

CODE aster

LEVEL **ADVANCED**

code_aster and HPC computing

Master parallel computing with code_aster: from HPC fundamentals to diagnosing and optimizing the performance of your industrial computations on a cluster.

DURATION	FORMAT	LANGUAGES	PRICE
1 day	**Remote**	**English**	**€900 excl. VAT** Academic €400 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Identify the parallel models (MPI, OpenMP, domain decomposition) used by code_aster.

02 Parallelise a code_aster analysis and measure its speed-up and efficiency.

03 Choose suitable computing resources for a study on a cluster.

04 Diagnose and optimise an industrial analysis that scales poorly.

Upcoming sessions

May 4, 2027

Remote · English

Full course page online

Does this sound familiar?

- Know when and how to parallelise, and where the computational cost really lies.
- Choose between shared memory, distributed memory and hybrid MPI/OpenMP.
- Diagnose a disappointing speed-up: solver, model partitioning or requested resources?

Audience

Industry: simulation engineers working on large models who want to cut turnaround times.

Academia: researchers and PhD students running intensive computations.

Prerequisites

Basic command of code_aster. General notions of parallel computing welcome; no prior HPC experience needed.

Detailed programme

MORNING

Parallel computing fundamentals and code_aster HPC architecture

- Why parallelise a finite element analysis, and where the cost lies
- Shared memory, distributed memory, hybrid MPI/OpenMP
- Domain decomposition and parallel solution strategies
- code_aster architecture and parallelisation options

AFTERNOON

Implementation, practicals and performance diagnosis

- Keywords and structuring the input for a parallel run
- **Practical:** parallelise a run, measure speed-up and parallel efficiency
- Scaling, choice of resources, indicators to monitor
- **Practical:** diagnose and optimise an industrial case that scales poorly

CODE aster

code_aster from a developer's perspective

Get hands-on with the code_aster development environment: from compiling the source to shipping an image, including code modification and regression testing.

LEVEL **ADVANCED**

DURATION	FORMAT	LANGUAGES	PRICE
1 day	**Remote**	**English**	**€900 excl. VAT** Academic €400 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Set up a local development environment and compile code_aster.

02 Modify Python, C++ or Fortran code and recompile incrementally.

03 Validate a change with non-regression tests (.mess, OK/NOOK).

04 Build and version a Docker or Apptainer image of your version.

Early bird: 10% off the company price
€810 instead of €900 excl. VAT for any registration by **January 18, 2027**, 2 months before the March 18 session.

Upcoming sessions

March 18, 2027 **−10%**
Remote · English

Full course page online

Does this sound familiar?

- Know where to look in the source code to modify a constitutive law or add an option.
- Compile code_aster with confidence and tell Spack's role apart from code_aster's own.
- Contribute cleanly: build, unit test, non-regression testing and packaging.

Audience

Industry: engineers and developers contributing to the source code, packaging deliverables or deploying on HPC.

Academia: researchers and PhD students developing their own features in code_aster.

Prerequisites

Good user-level practice of code_aster. Basic Python and C++/Fortran welcome; no prior compilation experience needed.

Detailed programme

MORNING

From the source code to your first modification

- Repository layout: Python, C++, Fortran, catalogues, tests
- Local environment: devcontainer, Spack, dependencies
- Full vs incremental build, quick diagnosis of a build error
- First Python/catalogue change, validated by a run

AFTERNOON

Compiled change, tests and delivery

- Day-to-day architecture: where to go depending on what you change
- C++ or Fortran change and incremental rebuild
- Testing: .mess files, OK/NOOK criteria, non-regression tests
- Docker image, Apptainer/Singularity conversion, versioning

CODE saturne salomé

LEVEL **INITIAL**

code_saturne and Salomé: CFD simulation

Discover the fundamentals of computational fluid dynamics (CFD) with code_saturne, from mesh generation to the analysis of results, through a step-by-step approach based on real-world industrial cases.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Build and mesh a fluid domain in Salomé, then check mesh quality.

02 Set up and run a code_saturne analysis: boundary conditions, turbulence, unsteady flow.

03 Post-process results in ParaView and make use of the solver logs.

04 Compare a simulation with experimental results and discuss its validity.

Early bird: 10% off the company price

€1,620 instead of €1,800 excl. VAT for any registration up to 2 months before the session: by **December 11, 2026** for the February 11 and 18 session, by **January 9, 2027** for the March 9–10 session.

Upcoming sessions

- **February 11 and 18, 2027** –10% — Remote · English
- **March 9–10, 2027** –10% — EDF Lab Paris-Saclay · French
- **June 3 and 10, 2027** — Remote · English
- **September 29–30, 2027** — EDF Lab Paris-Saclay · French
- **December 7 and 14, 2027** — Remote · English

Full course page online

Does this sound familiar?

- You want to switch to an open-source CFD code but don't know where to start.
- You lose time rerunning failed simulations: boundary conditions, coarse mesh, forgotten density–temperature coupling.
- You lack a method to read code_saturne logs and to validate your results against reference data.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic knowledge of fluid mechanics.

Detailed programme

DAY 1

MORNING

Diving into CFD and getting started

- Navier-Stokes equations, finite volume method, turbulence modelling
- Overview of code_saturne and introduction to Salomé
- **Practical 1** lid-driven cavity: study creation, meshing, set-up in the GUI

AFTERNOON

First simulations and analysis of results

- **Practical 1:** computation, ParaView post-processing, mesh quality
- **Practical 2** branched channel: logs, unsteady boundary conditions, density–temperature coupling

DAY 2

Stepping up with code_saturne

- **Practical 3** T-junction: Salomé meshing, set-up, analysis
- User-directory development, boundary layers, restart on a different mesh

Advanced case and comparison with experiment

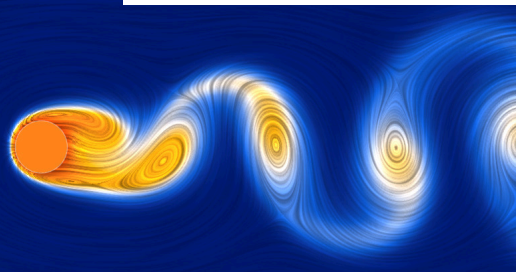
- **Practical 4** sudden-expansion channel: industrial case
- Comparison with experimental results, wrap-up

CODE saturne

LEVEL **ADVANCED**

code_saturne: thermo-hydraulics and heat transfer

Develop your expertise in code_saturne to model flows involving heat transfer and address industrial thermo-hydraulic challenges.



DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Set up a code_saturne thermal analysis in forced and natural convection.

02 Select and compare turbulence and heat transport models.

03 Customise a model with user files: heat sources, time-dependent boundary conditions.

04 Simulate conjugate fluid-solid heat transfer with radiation and check the energy balance.

Upcoming sessions

April 22 and 29, 2027
Remote · English

November 17–18, 2027
EDF Lab Paris-Saclay · French

Full course page online

Does this sound familiar?

- Model forced and natural convection, and choose the right turbulence model for heat transport.
- Extend code_saturne with your own user files: heat sources, time-dependent boundary conditions.
- Handle fluid–solid coupling and thermal radiation in your energy balances.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Command of code_saturne for simple studies, in-depth knowledge of fluid mechanics, solid CFD background and notions of thermo-hydraulics.

Detailed programme

DAY 1

THEORY

Foundations of thermo-hydraulics in CFD
- Principles and physical couplings of thermo-hydraulic flows
- Modelling turbulent heat transport
- Thermal settings in code_saturne

PRACTICALS

Forced and natural convection
- **Practical 1:** turbulent heated channel, turbulence model comparison, ParaView profiles and fluxes
- **Practical 2:** differentially heated cavity, buoyancy, Boussinesq vs dilatable fluid

DAY 2

THEORY

Customising and extending models
- User files and the SRC directory structure
- Modify – compile – run cycle
- **Practical 3:** localised heat source and time-dependent boundary conditions

PRACTICALS

Conjugate heat transfer and radiation
- **Practical 4:** fluid–solid conjugate heat transfer (CHT), interface fluxes
- **Practical 5:** adding thermal radiation, radiative share of the energy balance
- Questions, discussion and wrap-up

CODE saturne

LEVEL **ADVANCED**

code_saturne: CFD atmospheric dispersion

Master code_saturne to simulate airflow around a real site and assess the dispersion of a release, from geographic data to a sensitivity study.

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Build a site model from BD TOPO data and define the computational domain.

02 Translate weather data into atmospheric conditions in code_saturne.

03 Simulate the flow around buildings and identify recirculation zones and wakes.

04 Simulate a release, analyse the plume and run a sensitivity study with csauto.

Upcoming sessions

May 25–26, 2027
EDF Lab Paris-Saclay · French

October 28 and November 4, 2027
Remote · English

Full course page online

Does this sound familiar?

- Go beyond Gaussian models when buildings and terrain shape the flow, for your air quality or industrial risk studies.
- Quickly build a realistic site model: topography, buildings, computational domain and mesh.
- Turn weather data into input conditions and judge whether the plume and concentrations are plausible.

Audience

Industry: engineers and technicians who carry out or review dispersion, air quality or industrial risk studies.

Academia: researchers, PhD students and students working on atmospheric flows and dispersion.

Prerequisites

Command of code_saturne for simple studies.
Knowledge of fluid mechanics.

Detailed programme

DAY 1

THEORY

Fundamentals of atmospheric dispersion
- Atmospheric boundary layer, turbulence and stability
- Influence of terrain and buildings
- Best practices for atmospheric CFD

PRACTICALS

From the site to the flow around buildings
- **Practical 1:** BD TOPO data and computational domain
- **Practical 2:** weather data, wind rose, atmospheric conditions
- **Practical 3:** Salomé mesh, run without release, recirculation and wakes

DAY 2

THEORY

Modelling pollutant transport
- Turbulent transport of a scalar
- Defining and configuring a release

PRACTICALS

Atmospheric release and sensitivity study
- **Practical 4:** run with release, plume and concentrations in ParaView
- **Practical 5:** automated campaign with csauto, influence of weather
- Best practices, modelling limits and review

openTELEMAC

LEVEL **INITIAL**

openTELEMAC: free-surface hydraulic simulation

Discover the fundamentals of free-surface hydraulics with openTELEMAC, from building the mesh to simulating a realistic flood, through a step-by-step approach based on real geographic data.

Illustrative image, not a simulation result

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Mesh a river in QGIS with Q4TS: topography, friction, liquid boundaries.

02 Write and interpret a TELEMAC-2D steering file.

03 Run a simulation, read the logs and visualise the results.

04 Simulate a realistic flood and assess the effect of a structure (dyke, basin).

Early bird: 10% off the company price
€1,620 instead of €1,800 excl. VAT for any registration up to 2 months before the session: by **December 9, 2026** for the February 9 and 16 session, by **January 2, 2027** for the March 2–3 session.

Upcoming sessions

- **February 9 and 16, 2027** –10% — **Remote** · English
- **March 2–3, 2027** –10% — **EDF Lab Paris-Saclay** · French
- **September 15–16, 2027** — **EDF Lab Paris-Saclay** · French
- **October 19 and 26, 2027** — **Remote** · English

Full course page online

Does this sound familiar?

- Your hydraulic simulations fail or give inconsistent results: supercritical boundaries, solver settings, obscure error messages.
- You want to switch to an open-source finite element / finite volume solver and structure your first runs.
- You struggle to interpret .slf files and to check that tides, salinity, temperature or turbulence are properly accounted for.

Audience

Industry: engineers and technicians with basic knowledge of the physical and numerical field covered by the course.

Academia: researchers, PhD students and students from higher education and research institutions.

Prerequisites

Basic knowledge of environmental hydraulics.

Detailed programme

DAY 1

MORNING

The fundamentals
- The openTELEMAC system and its typical applications
- From Navier–Stokes to Saint-Venant: the assumptions behind openTELEMAC
- Closure models and the method of characteristics

AFTERNOON

First steps with QGIS and TELEMAC
- Files needed to run a TELEMAC-2D simulation
- **Practical:** 2D river mesh with Q4TS, elevation, friction, liquid boundaries
- Running TELEMAC, visualising and interpreting results

DAY 2

Getting familiar with the TELEMAC workflow
- Steering file: syntax, logs, warnings, common keywords
- Overview of TELEMAC-3D and additional features (tracers, tides…)
- **Practical:** decoding the Day 1 steering file

Towards a realistic flood simulation
- Mesh refinement, Strickler coefficients from land-use data
- Flood simulation, ParaVis post-processing, adding a dike or retention basin
- Critical analysis; optionally, coupling with WAQTEL

openTELEMAC

LEVEL **ADVANCED**

openTELEMAC: water quality and sediment morphodynamic

Master openTELEMAC's advanced couplings: simulate water quality with WAQTEL and the evolution of sediment beds with GAIA, through concrete engineering cases.

Illustrative image, not a simulation result

DURATION	FORMAT	LANGUAGES	PRICE
2 days	On site or remote	French / English	€1,800 excl. VAT Academic €800 excl. VAT

Learning objectives

By the end of the course, you will be able to:

01 Activate and configure WAQTEL sub-modules coupled with TELEMAC-2D or 3D.

02 Simulate pollutant dispersion and critically analyse the results.

03 Configure GAIA: sediment classes, bedload transport, consolidation.

04 Model the morphodynamic evolution of a tidal estuary.

Upcoming sessions

May 13 and 20, 2027
Remote · English

June 30 and July 1, 2027
EDF Lab Paris-Saclay · French

December 7–8, 2027
EDF Lab Paris-Saclay · French

Full course page online

Does this sound familiar?

- Couple your TELEMAC-2D/3D hydrodynamic results with water-quality tracers.
- Choose the right WAQTEL sub-module to study pollutant dispersion and degradation over time.
- Model deposition, erosion and siltation with GAIA, and know which levers to adjust against field data.

Audience

Industry: environmental and hydraulic engineers working on water quality or sediment morphodynamics.

Academia: researchers and PhD students in aquatic ecosystems or sediment dynamics.

Prerequisites

Hands-on experience of TELEMAC-2D or TELEMAC-3D hydrodynamics. No prior experience of WAQTEL or GAIA required.

Detailed programme

DAY 1

MORNING

WAQTEL sub-modules in depth (lecture)
- Coupling modules with TELEMAC-2D and TELEMAC-3D
- O2, BIOMASS, EUTRO, MICROPOL, THERMIC, degradation laws
- Activating and using the models in TELEMAC

AFTERNOON

WAQTEL (practical)
- Adding tracers and couplings, critical reading of results
- Engineering case: dispersion of a micropollutant in lake-bed sediments over one year

DAY 2

Sediments and morphodynamics with GAIA (lecture)
- Sediment classes, 2D advection-diffusion, flocculation
- Bedload transport and corrections (slope, secondary currents)
- Consolidation, active layer, stratigraphy; .cli files, restart, NESTOR

GAIA (practical)
- Tidal estuary study with several sediment classes
- Deposition zones, salinity and clay flocculation

PRACTICAL DETAILS

Practical information

Schedule
9:00 am to 12:30 pm and 1:30 pm to 5:00 pm, i.e. 7 hours a day.

On-site sessions
At EDF Lab Paris-Saclay (Palaiseau). Lunches and coffee breaks included. Delivered in French, course materials in English.

Remote sessions
Two days one week apart, so you can put things into practice in between. Delivered in English.

Supervision
Each trainer supervises a maximum of 6 trainees during practical sessions.

Included
Help installing the latest version of the code and an official training completion certificate.

Registration
Online, from each session page: follow the date links in this catalogue.

Accessibility
We are committed to making our training accessible to people with disabilities. Please contact us before registering so that we can study together the adaptations that can be put in place.

Documents
Internal regulations and terms and conditions of sale are available on simvia.tech.

Funding

Company funding
Training paid for by the employer.

OPCO funding (France)
Simvia is Qualiopi-certified: French companies can have the course covered by their OPCO (skills operator) under the skills development plan.

CPF (France)
Our courses are not eligible for the CPF (French personal training account).

Prices per course

COURSE	COMPANY	ACADEMIC
code_aster and Salomé applied to mechanics	€1,800 excl. VAT	€800 excl. VAT
code_aster and Salomé applied to civil engineering	€1,800 excl. VAT	€800 excl. VAT
code_aster and Salomé applied to advanced civil engineering	€1,800 excl. VAT	€800 excl. VAT
code_aster: non-linearity, fatigue and multiphysics couplings	€1,800 excl. VAT	€800 excl. VAT
code_aster and MFront: modelling complex mechanical behaviour	€1,800 excl. VAT	€800 excl. VAT
code_aster and HPC computing	€900 excl. VAT	€400 excl. VAT
code_aster from a developer's perspective	€900 excl. VAT	€400 excl. VAT
code_saturne and Salomé: CFD simulation	€1,800 excl. VAT	€800 excl. VAT
code_saturne: thermo-hydraulics and heat transfer	€1,800 excl. VAT	€800 excl. VAT
code_saturne: CFD atmospheric dispersion	€1,800 excl. VAT	€800 excl. VAT
openTELEMAC: free-surface hydraulic simulation	€1,800 excl. VAT	€800 excl. VAT
openTELEMAC: water quality and sediment morphodynamic	€1,800 excl. VAT	€800 excl. VAT

Prices per trainee, excluding VAT, lunches and coffee breaks included for on-site sessions. For information only: the exact details (location, language, schedule) are given on each session page. Dates may change.

QUALITY

Assessment and follow-up

Every course follows the same assessment process, from needs analysis to the measurement of learning outcomes, in line with the French national quality framework (Qualiopi).

1

BEFORE

Positioning

A questionnaire records your level and expectations and checks the prerequisites, so the session can be adapted if needed.

2

DURING

Formative assessment

The trainer follows the practical work, with a formative assessment at the end of day 1 to check that day's learning.

3

END OF COURSE

Assessment of learning

A summative assessment at the end of the course validates each learning objective of the course page.

4

IMMEDIATE

Satisfaction

A satisfaction survey is completed on the last day of the course.

5

DELAYED

Application

Two months later, a survey of the trainee and the company assesses how the skills are being applied.

Qualiopi processus certifié

Training completion certificate

Given to each participant, it lists the objectives, the modules attended and the results of the assessment of learning.

A question about our training?

Our team will help you choose the right course for your needs and prepare your registration. In-house training is also available from 4 participants.

WRITE TO US

training@simvia.tech

Contact us →

Online catalogue ↗

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